NISTTech

Portable LED-Illuminated Radiance Source

Description

The invention is a portable device used as a replacement for lamp-based integrating sphere sources for applications requiring calibrating and characterizing radiation sources. The device uses Light Emitting Diodes (LEDs) as radiance sources, which improves determination of critical temperature for both initial characterizations and for periodic measurements. The LED source is useful for measuring the size-of-source effect (SSE) in radiation thermometers to determine that the SSE has not changed. Stable radiance output is maintained by a temperature control unit using a thermoelectric cooler integrated with the LED head.

Applications

- **Radiation thermometers**
  For calibration and characterization

- **Night vision devices**

- **Environmental remote sensing systems**

- **Biological agent detection**

- **Any radiometer which needs a stable radiance source**
  Used as a replacement for lamp-based integrating sphere sources

Advantages

- **Compact, portable, and easier to use than integrating spheres**

- **Mechanically robust and compact**

- **Provides stable and uniform radiance source with a long service life**

Abstract

The LED-radiance source is a suitable replacement of lamp-based integrating sphere sources where they are used as stable and uniform radiance sources. The LED-based radiance source includes an array of LEDs having substantially similar radiance output wavelengths and a radiation detector such as a photodiode that detects and monitors radiation directed from the LEDs. Temperature of the LEDs can be controlled by feedback from a photodiode, thereby allowing for control and

stabilization of temperature-dependent radiation output.

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Status of Availability

This invention is available for exclusive or non-exclusive commercialization licensing. Collaborative research opportunities are available.

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